

REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application. Claims 1-57 are pending, of which claims 1, 21, 38, 39, 46, and 54 have been amended. Support for the amendments can be found in the specification at least at page 5 line 22 to page 6 line 10, page 13 lines 18-25, and in Figs. 1 and 2.

Applicant's amendments and remarks after Final are appropriate under 37 C.F.R. §1.116 because they address the Office's remarks in the Final Action, and thus could not have been presented earlier. In addition, the amendments and remarks should be entered to place the application in better form for appeal.

35 U.S.C. §103 Claim Rejections

A. Claims 1-13, 15, 20-32, 34, 37-43, 46-51, and 54 are rejected under USC § 103(a) for obviousness over US Patent No. 5,799,173 to Gossler et al. (hereinafter, "Gossler"), in view of US Patent No. 6,728,748 to Mangipudi et al. (hereinafter, "Mangipudi") (*Office Action*, p.2).

B. Claims 14, 16-19, 33, 35-36, 44-45, 52-53, and 55-57 are rejected under USC § 103(a) for obviousness over Gossler in view of Mangipudi and further in view of US Patent No. 6,321,263 to Luzzi et al. (hereinafter, "Luzzi") (*Office Action*, p. 6). Applicant respectfully traverses the rejections.

1 **Claim 1** recites a method comprising:

2 dynamically determining present members of a load-balancing
3 cluster which includes nodes and a node manager; and

4 monitoring application-layer availability of one or more members of
5 the cluster, the monitoring being performed by one or more clients outside
6 of the cluster which are communicatively linked to the node manager in the
7 cluster, such that the monitoring is from a client perspective to detect an
8 error that may impact the application-layer availability as it appears to the
9 one or more clients from outside of the cluster.

10 Gossler and/or Mangipudi do not teach or suggest the combination of
11 feature(s) recited in claim 1. For example, Gossler and/or Mangipudi do not teach
12 or suggest “dynamically determining present members of a load-balancing cluster,
13 which includes nodes and a node manager” and “monitoring application-layer
14 availability of one or more members of the cluster, the monitoring being
15 performed by one or more clients outside of the cluster which are
16 communicatively linked to the node manager in the cluster, such that the
17 monitoring is from a client perspective to detect an error that may impact the
18 application-layer availability as it appears to the one or more clients from outside
19 of the cluster”, as recited in claim 1.

20 Gossler describes a technology for dynamically controlling the number of
21 servers in a transaction system comprising at least one service unit for processing
22 service requests (*Gossler*, Abstract). However, Gossler does not describe
23 dynamically determining present members of a load-balancing cluster, which
24 includes nodes and a node manager, as recited in claim 1. The Office
25 acknowledges that Gossler does not teach dynamically determining present
members of a load balancing cluster (*Office Action*, p.3). Similarly, Gossler does

1 not describe monitoring application-layer availability of one or more members of
2 the cluster, the monitoring being performed by one or more clients outside of the
3 cluster which are communicatively linked to the node manager in the cluster, such
4 that the monitoring is from a client perspective to detect an error that may impact
5 the application-layer availability as it appears to the one or more clients from
6 outside of the cluster, as recited in claim 1. The Office acknowledges that Gossler
7 does not teach monitoring application-layer availability of one or more members
8 of the cluster as such is observed from a client perspective (*Office Action*, p.3).
9 The Office then relies on Mangipudi as curing the deficiencies of Gossler (*Office*
10 *Action*, p.3; *Mangipudi* col.4 lns.28-65 and Fig. 2).

11 Mangipudi describes a technology which facilitates categorization and
12 routing of Web traffic based on Class of Service (COS) (*Mangipudi*, Abstract).
13 Mangipudi describes that host computers can be grouped into different clusters (or
14 classes) to facilitate provision of differentiated services. One of these host
15 computers, referred to as the routing host 200, includes a policy engine 210, and is
16 capable of receiving requests from client devices 202 (*Mangipudi*, col.9 lns.1-6).
17 An incoming request from a client device 202 is received by the routing host 200
18 which then assigns a class to the request (*Mangipudi*, col.9 lns.20-25). The policy
19 engine 210 in conjunction with the routing host 200 then distributes the incoming
20 traffic to the most available server 206 for that class (*Mangipudi*, col.9 lns.20-25).

21 To support its assertion of obviousness, the Office states that “Mangipudi
22 teaches...a system of load balancing where the application layer of servers [206]
23 and their availability are being dynamically determined and monitored from a
24 routing host [200] located outside of the cluster” (*Office Action*, p. 3; *Mangipudi*,
25

1 Col.4 lns.28-65 and Fig. 2). The Office compares routing host 200 of Mangipudi
2 to Applicants' node manager 110, and compares service hosts 206 of Mangipudi
3 to Applicants' nodes 112, and then identifies routing host 200 as being "located
4 outside of the cluster" (*Office Action*, p.3; *Mangipudi* col.4 lns.28-65 and Fig. 2).

5 Applicant notes that claim 1 has been amended to emphasize that
6 Applicants' load-balancing cluster includes both the nodes and the node manager,
7 and to emphasize that the monitoring of the application-layer availability of one or
8 more members of the cluster is being performed by one or more clients located
9 outside of the cluster which are communicatively linked to the node manager in
10 the cluster, such that the monitoring is from a client perspective to detect an error
11 that may impact the application-layer availability as it appears to the one or more
12 clients from outside of the cluster.

13 Applicant submits that Mangipudi fails to cure the deficiencies of Gossler,
14 as Mangipudi does not teach or suggest dynamically determining present members
15 of a load-balancing cluster, which includes nodes and a node manager, as recited
16 in claim 1. As described above, the Office compares routing host 200 of
17 Mangipudi to Applicants' node manager 110, and asserts that routing host 200 is
18 "located outside of the cluster" (*Office Action*, p.3; *Mangipudi* col.4 lns.28-65 and
19 Fig. 2). Therefore according to the Office's assertion that routing host 200 is
20 "located outside of the cluster", the load-balancing cluster of Mangipudi includes
21 only the service devices 206 (e.g., nodes) (*Office Action*, p.3; *Mangipudi* col.4
22 lns.28-65 and Fig. 2). Accordingly, Mangipudi does not describe dynamically
23 determining present members of a load-balancing cluster, which includes nodes
24 and a node manager, as recited in claim 1.

1 Applicant also submits that Mangipudi fails to cure the deficiencies of
2 Gossler, as Mangipudi does not teach or suggest “monitoring application-layer
3 availability of one or more members of the cluster, the monitoring being
4 performed by one or more clients outside of the cluster which are
5 communicatively linked to the node manager in the cluster”, as recited in claim 1.
6 (Emphasis Added). There is no discussion in Mangipudi of one or more clients
7 outside the cluster which are communicatively linked to the node manager in the
8 cluster and which monitor the application-layer availability of one or more
9 members of the cluster. As described above, the Office indicates that the load-
10 balancing cluster of Mangipudi only includes service devices 206 (i.e., the Office
11 states that routing host 200 is “located outside of the cluster”) (*Office Action*, p.3;
12 *Mangipudi* col.4 lns.28-65 and Fig. 2). Accordingly, Mangipudi does not describe
13 that the monitoring being performed by one or more clients outside of the cluster
14 which are communicatively linked to the node manager in the cluster, as recited in
15 claim 1.

16 Applicant also submits that Gossler and/or Mangipudi does not teach or
17 suggest “that the monitoring is from a client perspective to detect an error that may
18 impact the application-layer availability as it appears to the one or more clients
19 from outside of the cluster”, as recited in claim 1. There is no discussion in
20 Gossler and/or in Mangipudi that the monitoring (of the application-layer
21 availability) is being performed from a client perspective to detect an error that
22 may impact the application-layer availability as it appears to the one or more
23 clients from outside of the cluster. Instead, as described below, Applicant submits
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1 that any monitoring by the routing host 200 of Mangipudi is from an endocluster
2 perspective rather than from a client perspective.

3 For the sake of thoroughness, and because other claims reciting the same
4 and/or similar terminology currently stand rejected, Applicant notes that the
5 specification carefully describes the terminology recited in the claims, including
6 what is meant by “a load-balancing cluster” and what is meant by monitoring the
7 application-layer availability of one or more members of the cluster from “a client-
8 perspective” or “exocluster perspective”.

9 Starting first with what is meant by “a load-balancing cluster”, Fig. 1 of
10 the Specification shows that a load-balancing cluster 100 includes nodes 112a-f
11 and also includes a node manager 110 which serves as the gatekeeper for the
12 nodes of the cluster (*Specification*, Fig. 1, p.3 lns.1-16, and p.5 ln.5 to p.6 ln.21).
13 Thus, the Specification defines “the cluster” as including both the nodes 112 and
14 the node manager 110 (*Specification*, Fig. 1, p.3 lns.1-16, and p.5 ln.5 to p.6
15 ln.21). As described above, claim 1 has been amended to further emphasize this
16 point and now recites “dynamically determining present members of
17 a load-balancing cluster, which includes nodes and a node manager.” (*Emphasis*
18 *Added*).

19 Turning now to what is meant by monitoring the application-layer
20 availability of one or more members of the cluster from “a client-perspective”,
21 “exocluster perspective” or “remote perspective”. The Specification describes two
22 ways to monitor application-layer availability of the nodes in a cluster: locally and
23 remotely (*Specification*, p.5 lns.18-19).
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1 “Local”, “endocluster”, or “cluster-perspective” application-layer
2 monitoring is done from within the cluster, and is performed by the node manager
3 and/or the nodes themselves (*Specification*, p.5 lns.15-23). For example, if node
4 manager 110 monitors the application-layer availability of the nodes 112a-f, then
5 this is local monitoring or “endocluster” monitoring (*Specification*, p.5 lns.15-23
6 and Fig. 1).

7 In contrast, “client-perspective”, “remote” or “exocluster” application-layer
8 monitoring is not performed by the node manager and/or the nodes themselves,
9 but is instead performed by one or more computers which are located outside of
10 the cluster, and which are communicatively coupled to the cluster (*Specification*,
11 p.5 lns.24-25 and p.6 lns.1-10, and Fig.1). For example, if client 132 monitors the
12 application-layer availability of the nodes 112a-f, this would be client-perspective
13 monitoring or exocluster monitoring (*Specification*, p.6 lns.2-4 and Fig. 1).

14 As described above, Claim 1 has been amended to emphasize this
15 distinction and now recites “monitoring application-layer availability of one or
16 more members of the cluster, the monitoring being performed by one or more
17 clients outside of the cluster which are communicatively linked to the node
18 manager in the cluster, such that the monitoring is from a client perspective to
19 detect an error that may impact the application-layer availability as it appears to
20 the one or more clients from outside of the cluster.” (*Emphasis Added*).

21 Stated simply, the Specification describes and the claims recite that “the
22 cluster” includes both the nodes and the node manager, and that monitoring from
23 “the client perspective” and is performed by one or more clients located outside of
24 the cluster which are communicatively linked to the node manager in the cluster,
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1 such that the monitoring is from a client perspective to detect an error that may
2 impact the application-layer availability as it appears to the one or more clients
3 from outside of the cluster (*Specification*, p.5 lns.24-25).

4 With this understanding, Applicant submits that the monitoring model
5 disclosed by Mangipudi is directly analogous to the “local” or “endocluster”
6 monitor model, which is described on p. 5, lines 19-23 in the Background section
7 of the Application. These lines state that, “[l]ocal application-layer monitoring is
8 ... performed by the node manager and/or the nodes themselves. Such ‘cluster-
9 perspective’ monitoring is the opposite of monitoring from a ‘client perspective,’”
10 as recited in claim 1. The Mangipudi reference effectively teaches away from
11 Applicants’ claimed subject matter, the antithesis of obviousness.

12 Therefore, Applicant submits that Mangipudi fails to cure the deficiencies
13 of Gossler, as Mangipudi fails to teach or suggest “monitoring being performed by
14 one or more clients outside of the cluster which are communicatively linked to the
15 node manager in the cluster, such that the monitoring is from a client perspective
16 to detect an error that may impact the application-layer availability as it appears to
17 the one or more clients from outside of the cluster,” as recited in claim 1.

18 Accordingly, claim 1 is allowable over the Gossler-Mangipudi combination
19 for at least the reasons described above and Applicant respectfully requests that
20 the §103 rejection be withdrawn.

21
22 Claims 2-13, 15 and 20 are allowable over the Gossler-Mangipudi
23 combination by virtue of their dependency upon allowable claim 1. Additionally,
24 one or more of these claims may also be allowable for independent reasons.
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2 **Claims 14 and 16-19** are allowable over the Gossler-Mangipudi
3 combination by virtue of their dependency upon allowable claim 1. Claims 14 and
4 16-19 are also allowable over the Gossler-Mangipudi-Luzzi combination because
5 Luzzi does not address the deficiencies of the Gossler-Mangipudi combination as
6 described above in response to the rejection of claim 1. Additionally, one or more
7 of these claims may also be allowable for independent reasons.

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9 **Claim 21** recites a method comprising:

10
11 monitoring application-layer availability of members of a load-
12 balancing cluster which includes nodes and a node manager, the monitoring
13 being performed by one or more clients outside of the cluster which are
14 communicatively linked to the node manager in the cluster, such that the
15 monitoring is from a client perspective to detect an error that may impact
16 the application-layer availability as it appears to the one or more clients
17 from outside of the cluster; and
18 exocusterly controlling activity state of the members of the cluster.

19
20 Gossler and/or Mangipudi do not teach or suggest the combination of
21 feature(s) recited in claim 21. For example as described above in response to the
22 rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest
23 "monitoring application-layer availability of members of a load-balancing cluster
24 which includes nodes and a node manager, the monitoring being performed by one
25 or more clients outside of the cluster which are communicatively linked to the
node manager in the cluster, such that the monitoring is from a client perspective
to detect an error that may impact the application-layer availability as it appears to
the one or more clients from outside of the cluster" as recited in claim 21. Further,

1 Gossler and/or Mangipudi do not teach or suggest exocusterly controlling activity
2 state of the members of the cluster, as recited in claim 21.

3 Claim 21 has been rejected by the Office for the same reasons as it rejects
4 claims 1-2 above. If it is valid to reject this claim for the same reasons that claims
5 1-2 above are rejected, then Applicant submits that this claim is allowable over the
6 Gossler-Mangipudi combination for at least the reasons described above in
7 response to the rejection of claims 1-2.

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9 Claims 22-32, 34 and 37 are allowable over the Gossler-Mangipudi
10 combination by virtue of their dependency upon allowable claim 21. Additionally,
11 one or more of these claims may also be allowable for independent reasons.

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13 Claims 33 and 35-36 are allowable over the Gossler-Mangipudi
14 combination by virtue of their dependency upon allowable claim 21. Claims 33
15 and 35-36 are also allowable over the Gossler-Mangipudi-Luzzi combination
16 because Luzzi does not address the deficiencies of the Gossler-Mangipudi
17 combination as described above in response to the rejection of claim 1.
18 Additionally, one or more of these claims may also be allowable for independent
19 reasons.

1 **Claims 38** recites a computer-readable medium having computer-
2 executable instructions that, when executed by a computer, perform a method
3 comprising:

4 dynamically determining present members of a load-balancing
5 cluster which includes nodes and a node manager and an activity state of
6 each member;

7 monitoring application-layer availability of the one or more
8 members of the cluster as such availability is observed by the computer
9 outside of the cluster which is communicatively linked to the node manager
10 in the cluster, such that the monitoring is from a client perspective to detect
11 an error that may impact the application-layer availability as it appears to
12 the computer from outside of the cluster; and

13 exocusterly controlling the activity state of the members of the
14 cluster.

15 Gossler and/or Mangipudi do not teach or suggest the combination of
16 feature(s) recited in claim 38. For example as described above in response to the
17 rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest
18 “dynamically determining present members of a load-balancing cluster which
19 includes nodes and a node manager and an activity state of each member” as
20 recited in claim 38. Further, as described above in response to the rejection of
21 claims 1 and 21, Gossler and/or Mangipudi do not teach or suggest “monitoring
22 application-layer availability of the one or more members of the cluster as such
23 availability is observed by the computer outside of the cluster which is
24 communicatively linked to the node manager in the cluster, such that the
25 monitoring is from a client perspective to detect an error that may impact the
26 application-layer availability as it appears to the computer from outside of the
27 cluster”, as recited in claim 38. Still further, as described above in response to the
28 rejection of claim 21, Gossler and/or Mangipudi do not teach or suggest

1 “exocusterly controlling the activity state of the members of the cluster” as recited
2 in claim 38.

3 Claim 38 has been rejected by the Office for the same reasons as it rejects
4 claims 1-2 and 10 above. If it is valid to reject this claim for the same reasons that
5 claims 1-2 and 10 above are rejected, then Applicant submits that this claim is
6 allowable over the Gossler-Mangipudi combination for at least the reasons
7 described above in response to the rejection of claims 1-2 and 10.

8
9 **Claim 39** recites a system comprising:

10 a dynamic cluster-membership determiner configured to exocusterly
11 and dynamically determine present members of a load-balancing cluster
12 which includes nodes and a node manager; and

13 an exocuster monitor configured to monitor application-layer
14 availability of the present members of the cluster, the exocuster monitor
15 distributed across one or more clients outside of the cluster which are
16 communicatively linked to the node manager in the cluster, such that
17 monitoring is from a client perspective to detect an error that may impact
18 the application-layer availability as it appears to the one or more clients
19 from outside of the cluster.

20 Gossler and/or Mangipudi do not teach or suggest the combination of
21 feature(s) recited in claim 39. For example as described above in response to the
22 rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest “a dynamic
23 cluster-membership determiner configured to exocusterly and dynamically
24 determine present members of a load-balancing cluster which includes nodes and a
25 node manager” as recited in claim 39. Further, as described above in response to
the rejection of claims 1 and 21, Gossler and/or Mangipudi do not teach or suggest
“an exocuster monitor configured to monitor application-layer availability of the
present members of the cluster, the exocuster monitor distributed across one or

1 more clients outside of the cluster which are communicatively linked to the node
2 manager in the cluster, such that monitoring is from a client perspective to detect
3 an error that may impact the application-layer availability as it appears to the one
4 or more clients from outside of the cluster”, as recited in claim 39.

5 Claim 39 has been rejected by the Office for the same reasons as it rejects
6 claims 1-2, 4, 7, and 10 above. If it is valid to reject this claim for the same
7 reasons that claims 1-2, 4, 7, and 10 above are rejected, then Applicant submits
8 that this claim is allowable over the Gossler-Mangipudi combination for at least
9 the reasons described above in response to the rejection of claims 1-2, 4, 7, and 10.

10
11 **Claims 40-43** are allowable over the Gossler-Mangipudi combination by
12 virtue of their dependency upon allowable claim 39. Additionally, one or more of
13 these claims may also be allowable for independent reasons.

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15 **Claims 44-45** are allowable over the Gossler-Mangipudi combination by
16 virtue of their dependency upon allowable claim 39. Claims 44-45 are also
17 allowable over the Gossler-Mangipudi-Luzzi combination because Luzzi does not
18 address the deficiencies of the Gossler-Mangipudi combination as described above
19 in response to the rejection of claim 39. Additionally, one or more of these claims
20 may also be allowable for independent reasons.

1 **Claim 46** recites a system comprising:

2 an exocluster monitor configured to monitor application-layer
3 availability of members of a load-balancing cluster which includes nodes
4 and a node manager, the exocluster monitor distributed across one or more
5 clients outside of the cluster which are communicatively linked to the node
6 manager in the cluster, such that monitoring is from a client perspective to
7 detect an error that may impact the application-layer availability as it
8 appears to the one or more clients from outside of the cluster; and

9 an exocluster controller configured to control an activity state of
10 members of the cluster.

11 Gossler and/or Mangipudi do not teach or suggest the combination of
12 feature(s) recited in claim 46. For example as described above in response to the
13 rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest “an
14 exocluster monitor configured to monitor application-layer availability of
15 members of a load-balancing cluster which includes nodes and a node manager,
16 the exocluster monitor distributed across one or more clients outside of the cluster
17 which are communicatively linked to the node manager in the cluster, such that
18 monitoring is from a client perspective to detect an error that may impact the
19 application-layer availability as it appears to the one or more clients from outside
20 of the cluster” as recited in claim 46. Further, as described above in response to
21 the rejection of claim 21, Gossler and/or Mangipudi do not teach or suggest “an
22 exocluster controller configured to control an activity state of members of the
23 cluster”, as recited in claim 46.

24 Claim 46 has been rejected by the Office for the same reasons as it rejects
25 claims 1, 3-4, 6-7 and 10 above. If it is valid to reject this claim for the same
26 reasons that claims 1, 3-4, 6-7 and 10 above are rejected, then Applicant submits

1 that this claim is allowable over the Gossler-Mangipudi combination for at least
2 the reasons described above in response to the rejection of claims 1, 3-4, 6-7 and
3 10.

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5 **Claims 47-51** are allowable over the Gossler-Mangipudi combination by
6 virtue of their dependency upon allowable claim 46. Additionally, one or more of
7 these claims may also be allowable for independent reasons.

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9 **Claims 52-53** are allowable over the Gossler-Mangipudi combination by
10 virtue of their dependency upon allowable claim 46. Claims 52-53 are also
11 allowable over the Gossler-Mangipudi-Luzzi combination because Luzzi does not
12 address the deficiencies of the Gossler-Mangipudi combination as described above
13 in response to the rejection of claim 46. Additionally, one or more of these claims
14 may also be allowable for independent reasons.

1 **Claim 54** recites a dynamic, active, exocluster monitoring system for
2 monitoring application-layer availability of members of a load-balancing cluster
3 and for controlling an activity state of such members, the monitoring system
4 comprising:

5 cluster which includes nodes and a node manager, the app-monitor
6 distributed across one or more clients outside of the cluster which are
7 communicatively linked to the node manager in the cluster, such that
8 monitoring is from a client perspective to detect an error that may impact
9 the application-layer availability as it appears to the one or more clients
10 from outside of the cluster;

11 a cluster-control configured to exoclusterly determine the activity
12 state of the members of the cluster and to exoclusterly control the activity
13 state of the members of the cluster; and

14 a central controller configured to coordinate and control the app-
15 monitor and the cluster-control.

16 Gossler and/or Mangipudi do not teach or suggest the combination of
17 feature(s) recited in claim 54. For example as described above in response to the
18 rejection of claim 1, Gossler and/or Mangipudi do not teach or suggest "cluster
19 which includes nodes and a node manager, the app-monitor distributed across one
20 or more clients outside of the cluster which are communicatively linked to the
21 node manager in the cluster, such that monitoring is from a client perspective to
22 detect an error that may impact the application-layer availability as it appears to
23 the one or more clients from outside of the cluster" as recited in claim 54. Further,
24 as described above in response to the rejection of claim 21, Gossler and/or
25 Mangipudi do not teach or suggest "a cluster-control configured to exoclusterly
determine the activity state of the members of the cluster and to exoclusterly
control the activity state of the members of the cluster", as recited in claim 54.
Still further, Gossler and/or Mangipudi do not teach or suggest "a central

1 controller configured to coordinate and control the app-monitor and the cluster-
2 control”, as recited in claim 54.

3 Claim 54 has been rejected by the Office for the same reasons as it rejects
4 claims 1-2 and 10 above. If it is valid to reject this claim for the same reasons that
5 claims 1-2 and 10 above are rejected, then Applicant submits that this claim is
6 allowable over the Gossler-Mangipudi combination for at least the reasons
7 described above in response to the rejection of claims 1-2 and 10.

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9 **Claims 55-57** are allowable over the Gossler-Mangipudi combination by
10 virtue of their dependency upon allowable claim 54. Claims 55-57 are also
11 allowable over the Gossler-Mangipudi-Luzzi combination because Luzzi does not
12 address the deficiencies of the Gossler-Mangipudi combination as described above
13 in response to the rejection of claim 54. Additionally, one or more of these claims
14 may also be allowable for independent reasons.

15 16 **Dependent Claims**

17 In addition to its own merits, each dependent claim is allowable for the
18 same reasons that its base claim is allowable. Applicant submits that the Office
19 withdraw the rejection of each dependent claim where its base claim is allowable.
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Respectfully Submitted,

By: Anta Fisher

